Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-20. (*Canceled*)

21. (*Currently Amended*) A <u>phase estimation</u> system<u>, the system</u> comprising:

  ~~an input device~~ <u>a biological system</u> configured to ~~receive a signal produced by a biological system~~ <u>produce a bio-signal</u>; <u>and</u>

  a ~~processing~~ <u>computing</u> device configured to <u>receive the bio-signal and</u> determine a derivative of an estimated phase of the <u>bio-</u>signal, the estimated phase being indicative of a condition of the biological system, and <u>configured</u> to integrate the ~~derivative; and~~ <u>derivative,</u>

  ~~an output device configured to display the estimated phase.~~

  <u>wherein the estimated phase is displayed.</u>

22. (*Currently Amended*) The system of claim 21, wherein the ~~processing~~ <u>computing</u> device is further configured to produce an estimated <u>bio-</u>signal of the biological system as a function of the estimated phase.

23.   (*Currently Amended*) The system of claim 21, wherein:

the derivative of the estimated phase is a function of the bio-signal; and

the ~~processing~~ computing device is configured to subtract an estimated bio-signal of the biological system from the bio-signal to produce the function of the bio-signal.

24.   (*Currently Amended*) The system of claim 23, wherein the ~~processing~~ computing device is configured to subtract the estimated phase from a difference of the estimated bio-signal subtracted from the bio-signal to produce the function of the bio-signal.

25.   (*Currently Amended*) The system of claim 23, ~~further comprising~~ wherein the estimated phase is output. ~~a second output device configured to output the estimated signal.~~

26.   (*Currently Amended*) The system of claim 23, wherein the computing device ~~further comprising~~ comprises:

a Kalman filter configured to reduce noise in a difference of the estimated bio-signal subtracted from the bio-signal.

27.   (*Currently Amended*) The system of claim 26, wherein the Kalman filter is configured to produce a difference between a variable that represents a phase of the bio-signal and a variable that represents the estimated phase.

28.   (*Previously Presented*) The system of claim 22, wherein the function of the estimated phase comprises a sine function.

29.   (*Currently Amended*) The system of claim 23, wherein the ~~processing~~ computing device is configured to multiply a first factor by a difference of the estimated bio-signal subtracted from the bio-signal to produce the function of the bio-signal.

30.   (*Previously Presented*) The system of claim 29, wherein the first factor is equal to a product of a second factor multiplied by a third factor.

31.   (*Previously Presented*) The system of claim 30, wherein the second factor is a function of the estimated phase.

32.   (*Previously Presented*) The system of claim 31, wherein the function of the estimated phase is a cosine function.

33.   (*Currently Amended*) The system of claim 30, wherein the third factor is a function of a difference between a variable that represents a phase of the bio-signal and a variable that represents the estimated phase.

34.   (*Currently Amended*) The system of claim 33, wherein the function of the difference between the variable that represents the phase of the bio-signal and the variable that represents the estimated phase is a covariance function.

35.   (*Currently Amended*)   The system of claim 24, wherein the ~~processing~~ computing device is configured to multiply the estimated phase by a factor to produce the function of the bio-signal.

36-40. (*Canceled*)